Validating the 2017 County Economic Forecast

Introduction

There are no generally accepted criteria for validating a long term county forecast other than to evaluate predicted growth rates of the indicators with their historical growth rates. If future rates of growth are inconsistent with historical rates (and no extenuating circumstances or conditions would justify such inconsistencies), there is reason to suspect the reasonableness of the forecast.

Absent inconsistencies between rates of historical growth and forecasted growth, predicted future values are assumed to be plausible. The assumption of plausibility is the result of how the model was originally developed, where the basis for the relationships used to predict the indicators was derived from economic theory and other econometric forecast models of U.S. regions or states.

Another validation criteria for the county forecasts is the comparison of growth rates of the forecasted county indicators to the forecasted state indicators. This exercise was generally performed in the development of each county model and each final county forecast.

In no instance are the final forecasted growth rates of county indicators inconsistent with the growth rates observed historically.

And in no instance are the forecasted growth rates of county indicators inconsistent with the growth rates of the same indicators for the state.

Validation Criteria

A further validation occurs when the sum of the 58 county forecasts are compared with the independent forecast for California, derived from the June 2017 UCLA forecast for the state.

Compared are nine separate economic indicators that are forecast for each county from 2017 to 2050. They include demographic indicators such as population and households, and economic indicators such as employment, income, and taxable sales.

It is inevitable that independent forecasts will produce slightly different results, and some measurable forecast difference between the forecasts will normally occur. The confirmation that the forecasts are comparable is in directly proportional to the size of this forecast difference.

A reasonable and intuitive criterion would have the difference between the sum of the indicators for all 58 counties and that same indicator forecast for California to be at or under 5 percent (throughout the forecast horizon).

However, it is interesting to note (and emphasize) that the sum of the actual county indicators is rarely equal to the state total. This is true for the historical data for most indicators, dating back to at least 1990. Much of the time, this difference is due to survey error or county allocation issues, and is more than simple rounding.

For example, the sum of employment at the county level is frequently different from the statewide total, occasionally by more than 2 percent.

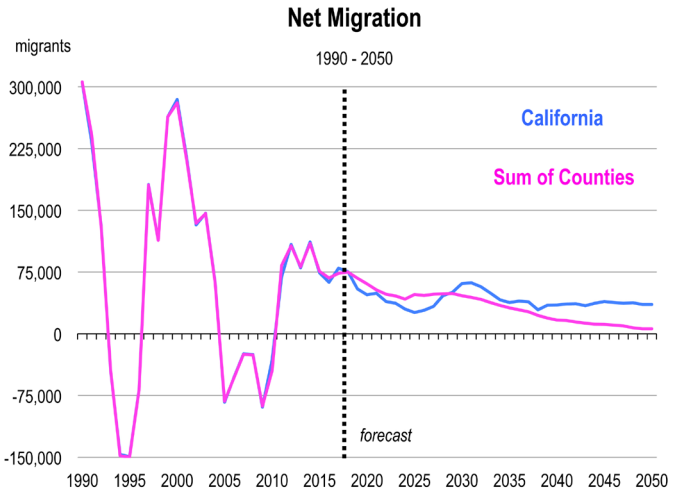
For a few common indicators that we use in the modeling process, it is possible to allocate them to the state but not to any particular county. Some vehicles, particularly trucks, are registered in the state but in no particular county. Taxable sales that are "use" taxes are allocated to the state but to no particular county. And there are other types of taxable sales recorded in the state totals that are not allocated to a particular county.

Consequently, the sum of the county indicators will not necessarily be equal to the state level indicator. Therefore, if there are differences with the historical values, there will also be differences with the forecasted values.

Results of the Validation

The 2017 forecasts for all 58 counties are very similar to the independent forecast for California. The sum of all 58 counties is within reasonable proximity to 5 percent of the state forecast for the majority of the indicators. The exceptions to this are net migration, new housing units, retail sales, and total taxable sales.

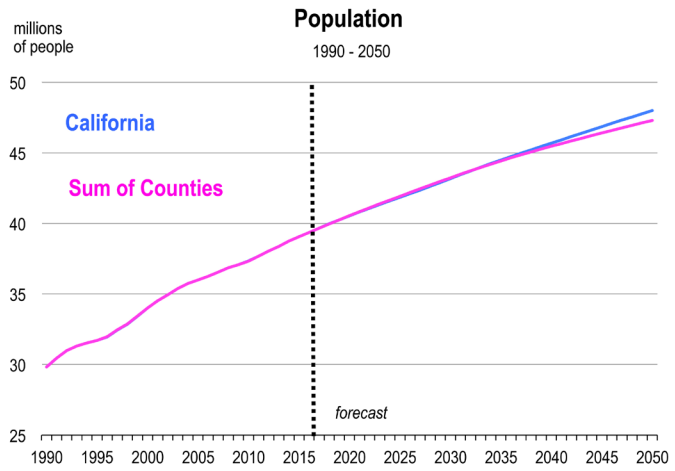
The sum of the county net migration forecasts generally track the UCLA statewide forecast from 2017 to 2050, but the annual difference varies by a larger amount during much of the forecast period and especially over the final 11 years of the forecast. Net migration is a volatile series and the history is measured with significant error. For many of the counties, it is difficult to accurately measure population and migratory patterns. Consequently, we are unconcerned with the differences that appear in the

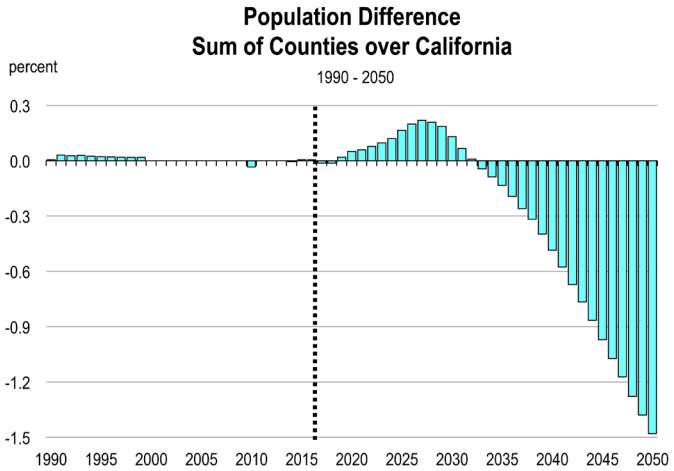


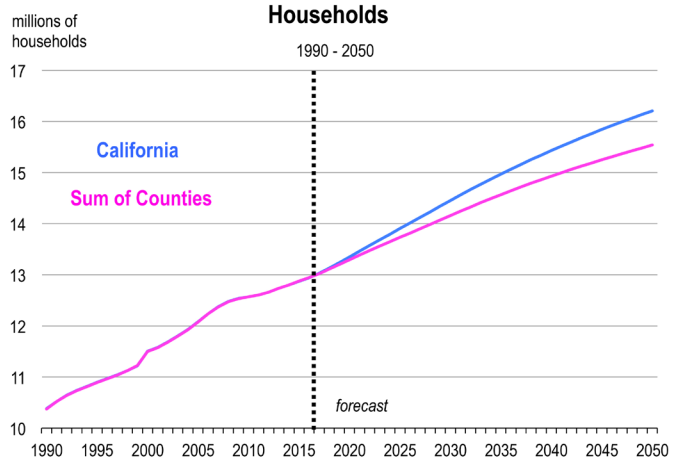
validation assessment. Visual inspection of the difference between the forecasts of the two series does not appear overly divergent or alarming.

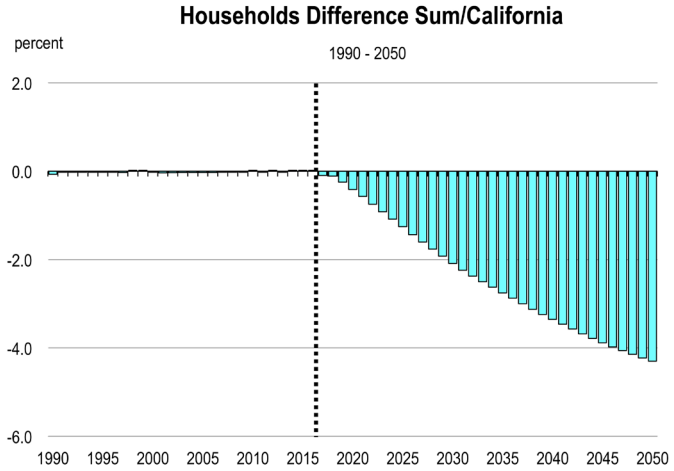
The county-level housing unit forecasts also differ significantly from the state forecast. Constraints on new housing development, especially in the coastal regions where land availability is becoming more sparse, have prevented housing production from expanding more rapidly. These constraints will likely remain in effect throughout the forecast period, keeping statewide housing production from reaching the levels implied by the UCLA forecast.

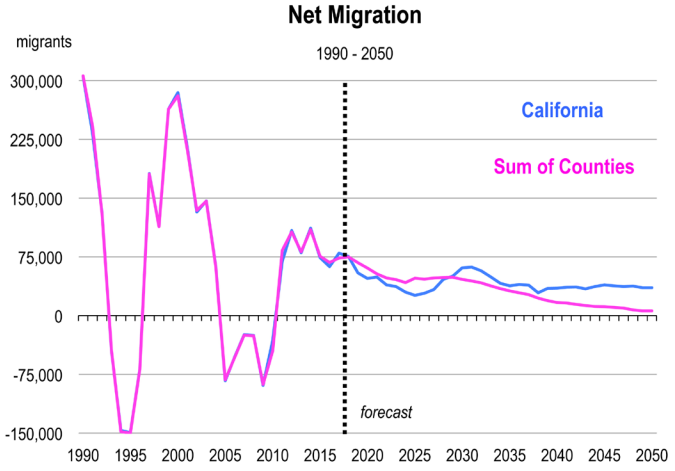
Regarding retail sales and total taxable sales, the sums of the county forecasts are slightly higher than the statewide forecasts. But for the majority of the forecast period, the difference is within the 5 percent interval. Consequently, the results are not overly concerning.

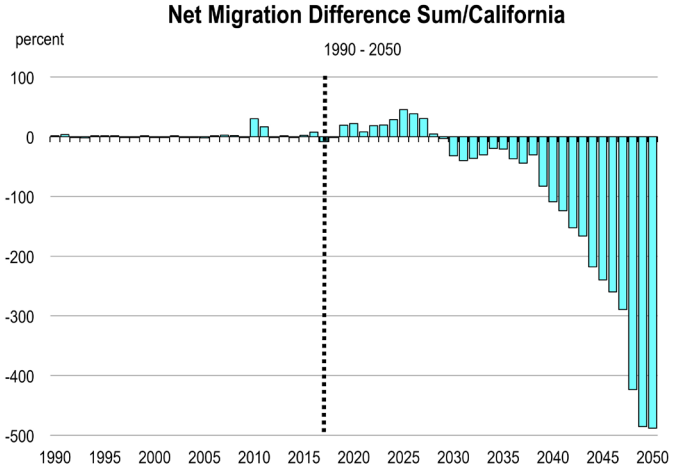

Population
millions
of people
1990 - 2050
50
45
40
35
30
25
California
Sum of Counties
forecast
1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050

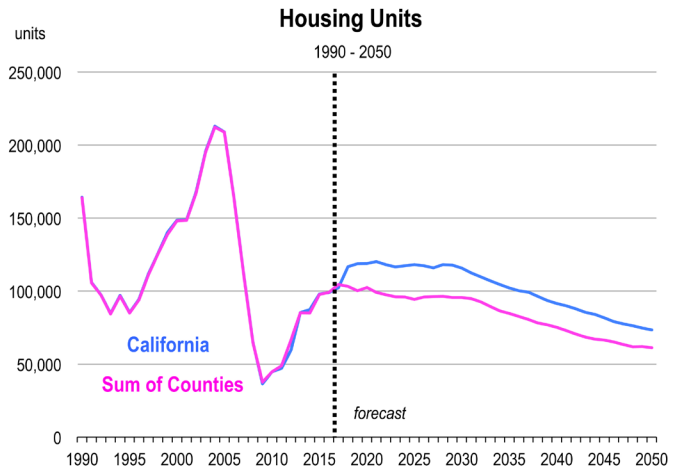

Population Difference
Sum of Counties over California
percent
1990 - 2050
0.3
0.0
-0.3
-0.6
-0.9
-1.2
-1.5
1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050

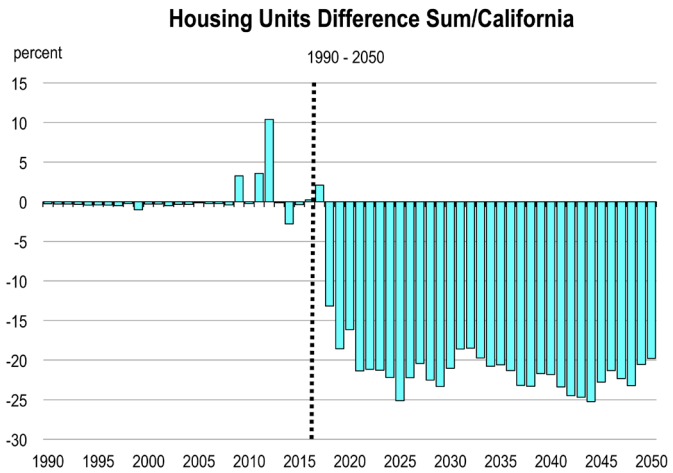

Households
millions of
households
1990 - 2050
17
16
15
14
13
12
11
10
California
Sum of Counties
forecast
1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050

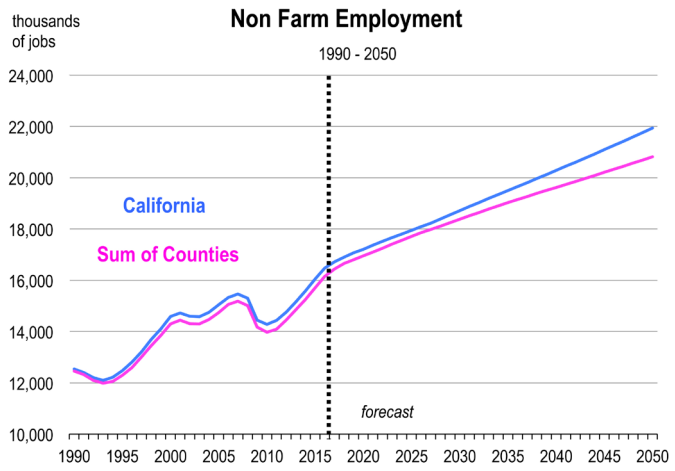

Households Difference Sum/California
percent
1990 - 2050
2.0
0.0
-2.0
-4.0
-6.0
1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050

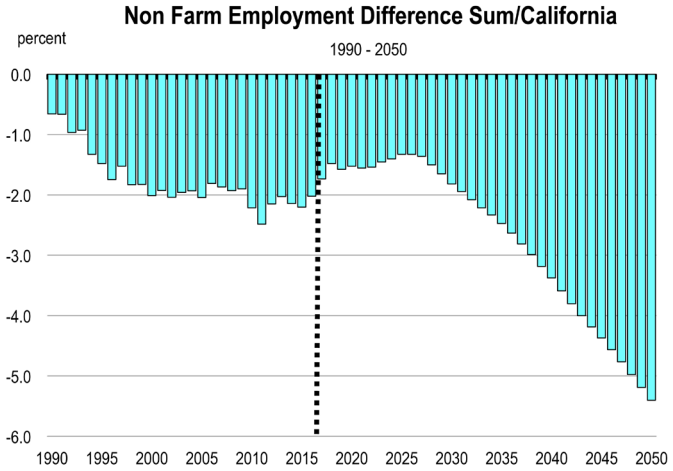

Net Migration
migrants
1990 - 2050
300,000
225,000
150,000
75,000
0
-75,000
-150,000
California
Sum of Counties
forecast
1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050

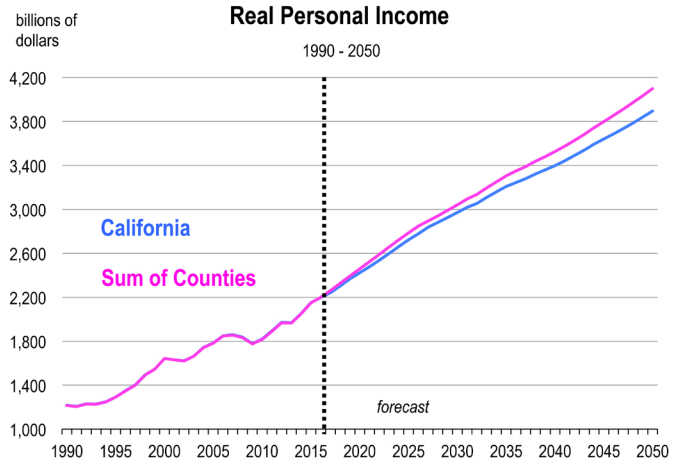

Net Migration Difference Sum/California
percent
1990 - 2050
100
0
-100
-200
-300
-400
-500
1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050

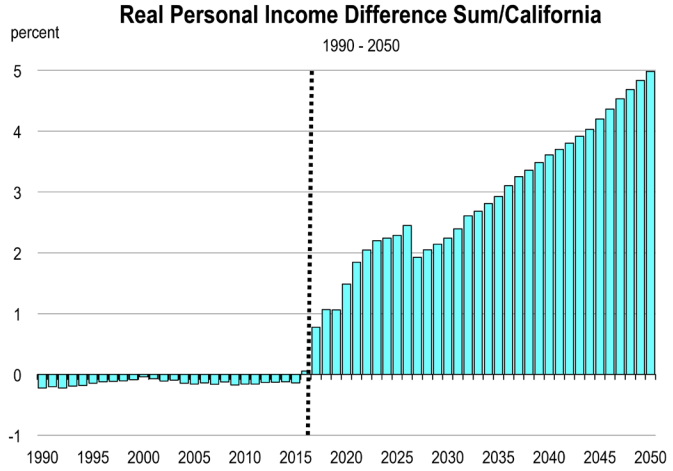

Housing Units
units
1990 - 2050
250,000
200,000
150,000
100,000
50,000
0
California
Sum of Counties
forecast
1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050

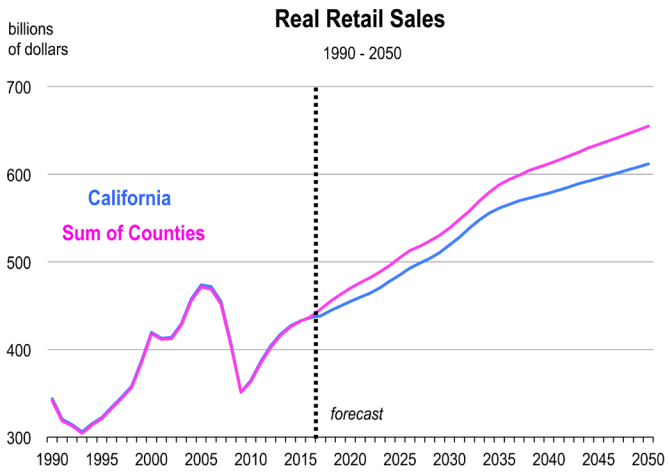

Housing Units Difference Sum/California
percent
1990 - 2050
15
10
5
0
-5
-10
-15
-20
-25
-30
1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050

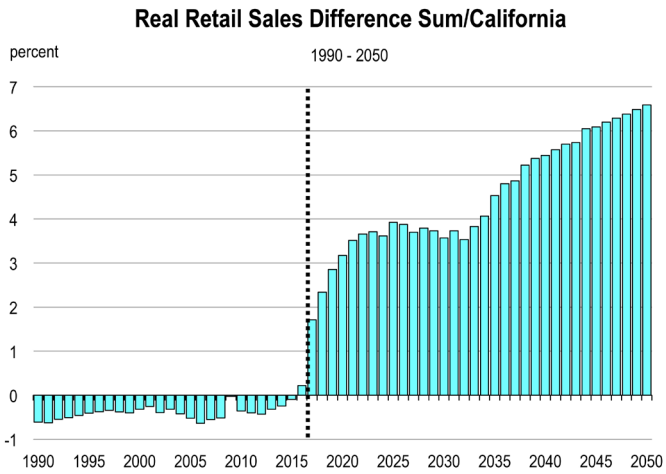

Non Farm Employment
thousands of jobs
1990 - 2050
24,000
22,000
20,000
18,000
16,000
14,000
12,000
10,000
California
Sum of Counties
forecast
1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050

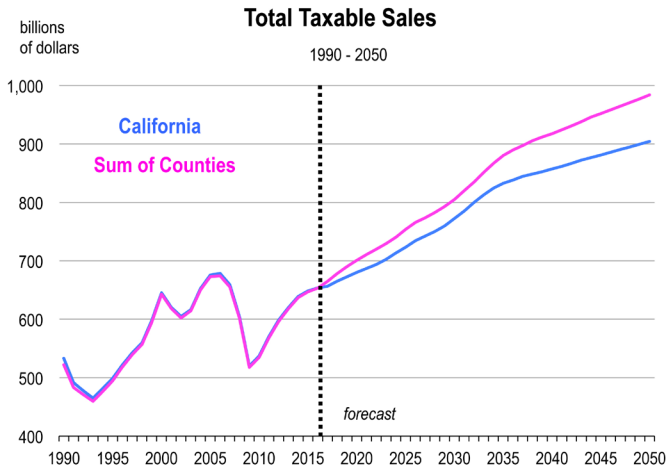

Non Farm Employment Difference Sum/California
percent
1990 - 2050
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
-6.0
1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050

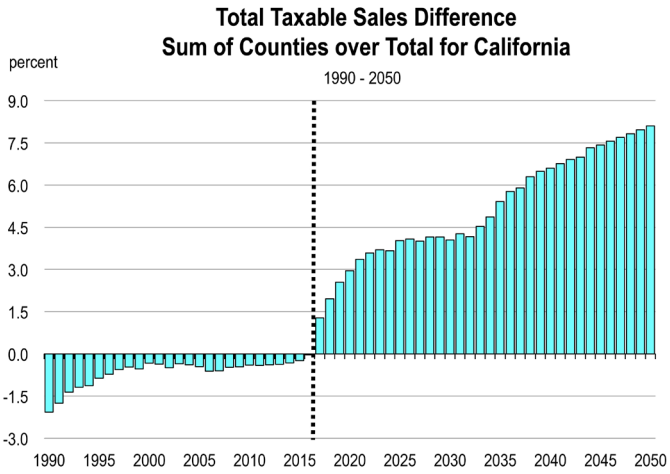

Real Personal Income
billions of dollars
1990 - 2050
4,200
3,800
3,400
3,000
2,600
2,200
1,800
1,400
1,000
California
Sum of Counties
forecast
1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050

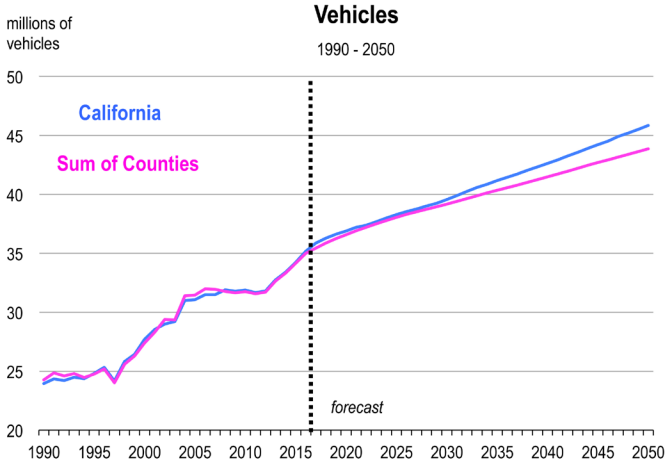

Real Personal Income Difference Sum/California
percent
1990 - 2050
5
4
3
2
1
0
-1
1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050

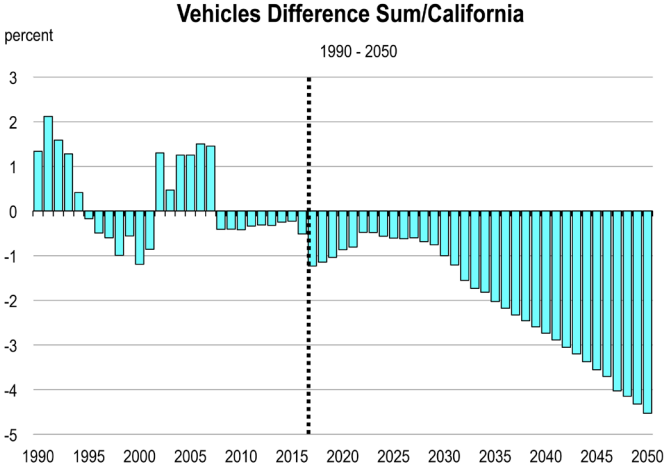

Real Retail Sales
billions
of dollars
1990 - 2050
700
600
500
400
300
California
Sum of Counties
forecast
1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050


Real Retail Sales Difference Sum/California
percent
1990 - 2050
7
6
5
4
3
2
1
0
-1
1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050


Total Taxable Sales
billions
of dollars
1990 - 2050
1,000
900
800
700
600
500
400
California
Sum of Counties
forecast
1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050


Total Taxable Sales Difference
Sum of Counties over Total for California
percent
1990 - 2050
9.0
7.5
6.0
4.5
3.0
1.5
0.0
-1.5
-3.0
1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050


Vehicles
millions of
vehicles
1990 - 2050
50
45
40
35
30
25
20
California
Sum of Counties
forecast
1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050


Vehicles Difference Sum/California
percent
1990 - 2050
3
2
1
0
-1
-2
-3
-4
-5
1990 1995 2000 2005 2010 2015 2020 2025 2030 2035 2040 2045 2050